The MINES of ARIZONA

This department is under the direction of Mr. W. E. Defty, the well known mining engineer, who will carefully scrutinize all matters relating to mining in order that only reliable information regarding legitimate enterprises shall find a place here.

The Republican would be pleased to receive information from any part of the state regarding the development of the mining industry. All communications should be addressed: Mining Department Arizona Republican.

No wiser move could have been made by the Ray Consolidated Copper Co. than the election of Mr. Cates to the directorate at a meeting of the corporation stockholders in New York on June 6. Mr. Cates succeeds A. Chester Beatty, the mining engineer.

Mr. Cates has accomplished great things at the company's property in Arizona. He is well versed and has a thorough knowledge of all the conditions in connection with the undertakings he so capably supervises. Therefore will add tremendous strength to the board's deliberations. It is a fitting compliment to so able a man and the board cannot help but greatly benefit by his sound judgment and advice gained by actual experience and hard work in the direction of the company's actual affairs.

Consolidated Arizona

It was not the smelter at Humboldt that suffered by fire, but the sampling works were absolutely destroyed. The loss is fully covered by insurance, however. The smelter will continue in operation from the Bell mine. Custom ores will again be received when the temporary sampling works are completd and this will be within the next thirty or sixty days. The success achieved by the undertaking is entirely owing to the present manager, Mr. Colnocrossos, who has shown great executive and business ability, coupled with an excellent technical knowledge.

United Verde Extension

United Verde Extension directors will meet for dividend action before the end of the month, according to present plans. A wide divergence of opinion prevails as to the initial rate. One group of reports credits a rate of $2 or $2.50 per share per annum. Another group of reports credits a rate of $5. Broad street is also guessing as to whether the rate will be a quarterly or monthly one.

Ray-Hercules

The Ray-Hercules Copper Co. is sinking a shaft to prepare for active mining. As previously announced, plans are being completed for the first 1,000-ton unit of a concentrator to be built at Kelvin, 6 miles below the mine and 12 miles nearer on the Phoenix & Arizona Eastern railroad than Ray Consolidated Copper Co.'s mill at Hayden. There are four churn drills operating day and night on the Ray-Hercules estate adding further to developed ore reserves.

Boston & Arizona

A letter from the manager of the Boston & Arizona says that good progress is being made in driving the main tunnel to cut the ore bodies under the rich surface showing from which smelter returns as high as 20 per cent copper were received. The progress is slow, owing to the hardness of the rock.

The manager reports that a rich streak of copper glance has been found, with another small stringer near it. These stringers are on the east side of the ridge while the tunnel is going in from the west side and indicate the extensive mineralization of the property. It is expected that the ore bodies in the tunnel will be cut before the end of the month.

DIVIDENDS

Phelps-Dodge

Phelps-Dodge & Co. have declared the regular quarterly dividend of $2.50 plus $3.50 extra payable June 30 to stock of record June 19. The same rate was paid three months ago and brings total dividends for the half year to $5,400,000. Profits were more than double this amount. The company usually pays a very substantial extra at Christmas.

Miami Copper

The Miami Copper Co.'s output in May was 4,596,338 pounds, April 4,050,000, and March 4,192,000.

Shattuck Arizona

The Shattuck Arizona Copper Co. reports for May an output of 1,383,963 lbs. of copper, which is slightly more than in April, but substantially under the record of the first quarter of the current year.

The Shattuck Arizona Copper Co. has declared a quarterly dividend of 50 cents and an extra dividend of 75 cents, payable July 20 to holders of record June 30.

The Shattuck paid $1.25 in April and $1 in January.

Shannon Copper Co

Shannon Copper Co. reports 1,074,000 pounds production in May versus 982,000 pounds in April.

Ray Consolidated

Ray is also expected to show a bumper output of copper for May. The mill has recently been handling close to 9,500 tons of ore daily, a remarkable record considering that the rated capacity of the plant is only 8,000 tons daily. In the first quarter of 1916 the mill averaged 8,200 tons daily, including a shut-down of several days when washouts on the railroad prevented ore transportation from mine to mill.

The Board of Directors of the Ray Consolidated Copper Company has this day declared a quarterly dividend of fifty cents per share, payable June 30, 1916, to stockholders of record at the close of business on June 16, 1916.

A. & A.

The Arkansas & Arizona Copper Co. has merged with the Mowles property and the Goodrich-Lockhart syndicate is financing the development of this large Jerome property. Unwatering operations have already begun. A 1,640 shaft is located just over the United Verde line and about 400 feet north of the main shaft of the United Verde.

Can You Beat It?

The London Arizona Consolidated Copper Co. shipped 500 tons of copper ore during the month of March. This ore is extracted from tunnels and cuts and placed in piles. These piles when large enough, are shoveled into boxes, which are carried on burros a distance of from one to three miles and emptied upon a platform. The ore is then shoveled into wagons and hauled to the railroad, where it is shoveled upon a makeshift platform. Then it is shoveled into a car and shipped.

The railroads will neither put in shipping facilities nor permit others to do so. The ore is mined from a stratum on the face of a canon about two miles long, running east and west. Two miles south of this other work is going on; two miles west, ore is being extracted.

All the work is in charge of one man, who is also the superintendent, physician, foreman, shiftboss, cashier, surveyor, buyer, storekeeper, roadboss, stableman and horseshoer. He does his own housework, cooks his food and pays for it from his own cash. He said a so-called big corporation made a contract a year ago to open the ground, but so far nothing has been done and the bondholders don't want such a corporation on the property. He said, moreover, if the would-be capitalists will keep away he will show up such a quanity of ore that some sensible man will gladly erect a smeltery on the ground. Can you beat it?

L. LYNDON

Winkelman, Ariz., Apr. 3, 1916.

(Engineering & Mining Journaly)

Quicksilver

Owing to the large deposits of quicksilver ores so near, north of Phoenix, we have endeavored to keep our readers well informed regarding the ores, their treatment and price. We have presented articles to their reduction by smeling, oil flotation and other methods. The following is an additional method of saving the values of the elusive metal:

Concentrating Quicksilver Ores

An investigation is being conducted by the California State Mining Bureau as to the feasibility of concentrating methods for quicksilver ores. Much exprimental work has yet to be done, but sufficient data have been gained to make a preliminary statement of partial results. Quicksilver mining in California has become more and more a question of economically handling larger tonnages of lower-grade ores. Since Robert Scott evolved his fine-ore tile furnace in 1871, there have been no improvements worthy of mention in the metallurgy of quicksilver until the present agitation for concentrating. A surprising feature of the situation is the absolute lack of any systematic sampling and assaying at the quicksilver mines. There is not a quicksilver mine in California known to possess or utilize an assay office. The distillation assay with the "Whitter" apparatus is simple, quick and accurate. The old-timers have been complacently saying, "the furnace gets it all" and that they did not need to assay. It is doubtful if the Scott fine-ore furnaces in operation in California are averaging 75 per cent extraction. In addition much quicksilver is absorbed by the furnace and condenser walls; also soot is formed which has to be re-treated for contained mercury. The products of fuel combustion, being mixed with the vaporized mercury, cause condensing troubles.

Experiments by Walter W. Bradley, of the staff of the Mining Bureau, have shown that high extraction (above 90 per cent) can be obtained by water concentration on tables, with friable ores in which the cinnabar is distinctly crystalline. Crushing by rolls produces a minimum of slimes. If, however, the pulp contains cinnabar slimes, the extraction by tables will be low, but can be improved by classification and treating the different sizes on separate tables. The slimed cinnabar can be recovered by flotation. High extraction has been obtained by flotation tests in finely ground (—80-mesh) fresh ores, utilizing either pine-oil derivatives or eucalyptus oils. "Fresh" ores are specified because, contrary to common conception, cinnabar on exposure does oxidize sufficiently to affect flotation results, as some of these tests have indicated. Good results were obtained by table concentration on an ore carrying natural quicksilver.

The concentrates have to be roasted. Retorts are of limited capacity, and the concentrates because of their high specific gravity require stirring to prevent packing. A small furnace of the Scott type could be used with a narrower shaft and narrow shelf-slit, such as in use at the New Idria mine for treating soot. Some form of rotary roaster may be adapted, or a small-sized unit of the McDougal or Wedge type of mechanically rabbled furnace, muffle-fired.

The ultimate decision between a straight furnace reduction or concentration and roasting of concentrates will be a matter of comparative costs coupled with comparative extractions. The initial installation of a Scott fine-ore furnace unit is high (including condensers, etc., $1,000 per ton per day capacity.) The extraction is low (in the majority of cases probably less than 75 per cent), and the cost of operation is low—50c to 75c per ton for large units, economically managed, though this does not include repairs, interest or depreciation on the high initial installation capital. A concentrating plant of equal capacity will require less than one-tenth the initial capital expenditure and a correspondingly lower depreciation charge. It will give 25 per cent to 30 per cent higher extraction, but the operating cost, on account of finer crushing, will be 20 per cent to 50 per cent higher.

Inspiration

There seemed to be no doubt yesterday but that the directors of the Inspiration Copper company will declare a larger dividend than the quarterly $1.25 at the meeting which takes place during the next few days. Opinions differed as to whether there would be an increase in the regular rate or whether the directors would decide to pay the additional in the shape of an extra. In some quarters the opinion was held that whatever was done the disbursement for the quarter would equal a dividend of $2 per share.

Inspiration has made wonderful progress since January and the production for May was in excess of the estimated capacity of the plant.

The estimated capacity of the Inspiration plants was 120,000,000 lbs. per month but it will be observed that the output in May exceeded that rate. This is really a remarkably short time in which to increase the output of the plant to the limit, but it is no more remarkable than the rapidity with which the earning capacity has increased. It is estimated that if present prices continue Inspiration will earn in one year nearly its entire cash outlay on the properties.

Taking a cost of 8½ cts. for Inspiration and with metal prices as they are, the Inspiration is believed to be earning at the rate of $20 per share per annum on the stock and in view of that showing the payment of a larger regular dividend or the declaration of an extra to bring the amount to $2 per share for the quarter would seem conservative. In fact the directors of the leading copper producers nowadays are adopting an ultra conservative stand even with the increased disbursements that have been made and if anything the fault is in taking too conservative a stand rather than the reverse.

Whether mining really benefits from the kiting of shares on local stock exchanges and the use of mines as an excuse for a game in which the dice are loaded is a moot question. The only good we can see is the actual work done at the mines, the employment given to labor, and the market created for machinery. Wild-cats have been known to develop into domestic felines hardly distinguishable from the best-bred Angoras; that must be conceded. The harm is done not by the open-eyed gambling of the knowing ones, but by the loss of money to that portion of the public unable to distinguish between the 'game' and the 'industry' of mining.—From Mining & Scientific Press.

Hiring, Handling and Firing Men

(By E. F. Irwin)

After being in charge of the Employment Department of the Homestake Mining company for 14 years I feel that if I could put the results of such experience in suitable words it would be of inestimable benefit to the students ready to begin active work in the mining world. An education along technical lines generally misses one of the greatest problems of success in mining, the human element, the handling of men. Two-thirds of the money spent in mining goes for labor. To get the best there is for that money means the study of human nature, to become acquainted with the men applying for work, and to be able to pick and choose so that the result will be a force of efficient, intelligent, and ambitious men.

I put efficiency first. To get the work done and done well, the first question is whether the applicant is physically sound and has a reasonably long life ahead of him. Working in mines is hard work at the best and it would be poor judgment to hire a man who has given the better part of his life to previous employers. Look to the future as much in judging physical qualifications as in mental.

Intelligence is so obvious that it needs not be dwelt upon, only that in employing day laborers one is apt to think the bigger the man the more work he will turn out, losing sight of the fact that he may never be able to take a position above the pick and shovel and thus you are closing one place where an intelligent man would profit by the experience and be made into a skilled workman, ready to go higher when needed.

Ambition in a man is worth more than any other qualification. It is the spur that constantly goads him on, making hard work and poor surroundings bearable, when he knows that overcoming such obstacles better fits him for the positions higher up. Ambition fosters determination and an iron will that never admits failure. When a man says he is willing to do anything to get a start he will make a good man anywhere. Encourage ambition in your men by promoting the most efficient, thus showing other employees the reward to be gained by ambition regardless of length of service.

Hiring men is a constant study of human nature. Talk to an applicant, ask him questions, draw him out to talk of himself. If he has been wandering all over the mining world, and is anxious to tell how many different places he has worked, he will not make a steady employee, not worth keeping a steady man out for. Do not depend on first impressions as to shifty eyes, nervousness, or inability to talk fluently. Some of the best men's eyes are constantly moving while they are talking, and many a rogue cultivates a steady gaze. In asking questions rapidly no man can deceive you long. You will see his mental activity in making up answers showing in a hesitancy of speech, a mental grouping of the best things to tell and what to conceal. Weigh all these things in your mind before judging and do not let prejudice influence you too much. While the man does not impress you very favorably, he may have good qualities that can be brought out and cultivated. Hard luck stories denote an unstable man. The man who must have work immediately or starve usually is telling the same story to another mine official in another state in thirty days.

Be optimistic. Overlook the minor faults and try to bring out the good points in your men. Every man will respond to encouraging words, while sarcasm and short, ugly tones in giving orders antagonize the men. Do not try to impress men with your authority. The fact that you are in charge is sufficient evidence that you are 'boss.' To illustrate this point: A party of sightseers, among them some young ladies, were visiting a large rock quarry. They were very much interested in the work, the machinery, the blasting, and other things. After the trip one gushing young lady addressed the foreman:

"Mr. Flannigan, this is wonderful, wonderful; but how is it kept going; who looks after it all; who is the boss here?"

"I am ma'am."

"Indeed, but it does not seem possible."

"Do you doubt it? Jimmie, come here! (Jimmie comes.) Ye're fired."

So Jimmie, in order that the lady might be shown who is boss, is out of a job and a new man has to be employed and broken in to take his place.

Every man employed should be watched and studied carefully, to see if he comes up to your estimate of him, and if not, make a mental note of where you were mistaken in hiring him and avoid it in the future. Be enthusiastic in your work; get that spirit among your men, and your future in the mining world is assured even though you were not at the head of your graduating class.

When you have employed a good working force use your best endeavors to hold them together. Do not conclude, if a man quits or is discharged, you can easily get another. You can lose on every change. Breaking in new men costs money. If the man you lost was a good man your chances of getting another good one to take his place are about one in five. In other words, you will hire five average men to get one thoroughly dependable. This may sound contradictory, when you have used your best endeavor to hire good men, but good men are always in demand. They are kept when hired and the floating class you get your men from are usually the ones from other places where they failed to make good.

The social welfare of your men is just as important an item as the machinery to work with. Laborers must have diversion. The periodical drunken carouse was formerly, and, as much as we regret it, is today to some extent, the diversion of miners. But it is being replaced by means of recreation. The Homestake company has a large recreation building containing a library, theater, pool and billiard room, bowling alleys, gymnasium, rest-room, and swimming-pool, and it is a good investment. The men are better for it, and some way of diverting the men's mind from the continual grind of daily work should be provided at every mine.

Bear in mind that hiring is the first, handling second, and 'firing' last and least. Good hiring and handling leave little cause for 'firing.' Finally, when you have to discharge a man talk to him plainly and frankly. Try to have him understand where he failed, as you see it. He may profit by the talk, and the plain statement of it from your point of view makes a better man of him when he starts again. When 'firing' do not consign him to the job of everlasting firing in the hereafter. He may make good elsewhere and then you will regret your failure to make a good employee of him while you had the chance.

Summing up: "Do unto others as you would that they should do unto you."

SUDAN GRASS EQUAL TO TIMOTHY HAY

Answering an inquiry regarding the culture of Sudan grass, Professor J. F. Nicholson, agronomist of the U. of A. Agricultural Experiment Station, says: Relative to the cultivation of Sudan grass, will say that the experience of the station has not been as extensive as we hope that it will be, but up to the present time we are prepared to highly endorse Sudan grass as a forage crop for both the irrigated and dry farming sections of our state. Sudan grass makes a hay equal in feed value to timothy, and will produce much more tonnage than that grass per acre. It grows very rapidly under our warm climate, and farmers in the Salt River valley have already obtained a cutting of hay seven feet tall which was seeded sixty days previous. They will be able to make at least two more cuttings before the crop is stopped by fall frosts. Generally, under irrigation we recommend sowing broadcast or in drill rows, at that rate of about 15 pounds per acre. It can be sown any time after danger of severe frost is over, or can be sown practically any time during the summer. The amount of tonnage is determined by the length of growing season given to the crop. Practically no care is required after the seed is put in, but the seed bed should be thoroughly prepared and plenty of moisture in the soil at seeding time to germinate the seeds. Sudan grass is not a heavy moisture feeder, in fact it is one of the dry-farming forage crops, highly recommended when the rainfall is meager. Cutting should take place when the earliest heads are in the dough. Of course, there will be new suckers coming on continually and a large amount of it will be blooming, and some not yet in bloom. When the Sudan is grown for seed it should be left until the majority of the stools are ripe, and on account of its sending out new suckers all the time, the straw after threshing makes a valuable forage. Some of our farmers are sowing Sudan with poor stands of alfalfa for pasturage, which is not a bad idea, because the Sudan in the alfalfa will have a tendency to prevent bloating when cattle and sheep are pastured on it. Sudan is so much like Johnson grass, the seeds being practically identical, that in buying the seed care must be taken to get it free from Johnson grass. Some firms will guarantee their seed to be pure, others will not. I presume the only way to be certain that you are getting pure Sudan grass is to buy a seed grown north of the region where Johnson grass will grow. Any seed grown in Kansas, Utah or Idaho would be quite certain to be free from Johnson grass, because Johnson grass does not thrive in those latitudes. If you desire to plant the Sudan in rows, which is frequently done under irrigation, and always done under dry-farming, I would put the rows 30 to 36 inches apart and plant at the rate of five or six pounds per acre. This will give you a coarser hay, on account of the stools having more room and spreading laterally, and almost as much tonnage as you would get from the broadcast or drilled crop. For seed purposes this would be particularly desirable, because you could keep it cultivated and then cut down any obnoxious weed seeds that might grow in the broadcast or drilled crops. The amount of water to add will turn largely upon the character of the soil, and if it has a tendency to be somewhat water-logged you will have difficulty in getting a good stand of Sudan, because it is naturally a dry climate plant.

A CITY BURNS SEWER GAS

Throngs the ingenuity of Charles C. Hommon the city of Atlanta is using sewer gas for heat, power and light purposes.

Mr. Hommon, who is chemist and bacteriologist for the city, has installed machinery by which gas is drawn from the sewers and is made to serve the city in a profitable way. —From the Columbus Dispatch.